

Map Unit Properties Table

Age	Unit Name (Symbol)	Features and Description	Erosion Resistance	Suitability for Development	Hazards	Paleontological Resources	Cultural Resources	Karst Potential	Mineral Occurrence	Habitat	Recreation	Global Significance
QUATERNARY (Holocene)	Alluvium (Qal), modern floodplain alluvium (Qmfa), late Holocene terrace alluvium (Qtah), and travertine (Qt).	Gravel, sand, and silt along stream valleys; floodplain deposits of fine-grained material in thin, loamy beds; eroded terrace deposits as much as 9 m (30 ft) thick; spring- and stream-deposited calcium carbonate, commonly present as intergranular cement.	Very low; low to moderate in travertine-cemented beds.	High porosity and permeability renders unit unsuitable for waste facilities; building projects should avoid areas with slopes.	Slumps, slides, and mass wasting possible.	Modern agricultural surface, potential for land-use evolution study.	Land-use evolution, possible Native American sites.	None	Travertine mixed with alluvium; sand and gravel.	Pecan trees, grasslands, modern land surface for cattle.	Suitable for most uses, including hiking, picnicking, camping.	Records land use for LBJ ranch.
QUATERNARY (Pleistocene-Holocene)	Late Pleistocene/late Holocene upland colluvium (Qc).	Coarse-grained, upland slope deposits containing some buried paleosols and calcareous layers locally.	Low	Building projects should avoid areas with slopes.	Slumps, slides, and mass wasting possible.	Potential for Pleistocene fossils and modern remains.	Possible Native American sites.	None	Sand and gravel	Juniper-oak-mesquite savanna, cattle rangeland.	Suitable for most uses, including hiking, picnicking, camping	None documented
QUATERNARY (Pleistocene)	High gravel (Qhg) and late Pleistocene terrace alluvium (Qtap).	Gravel and sand in terraces along streams, some 5-12 m (16-39 ft) above present channels; some colluvial deposits along slopes; caliche present locally; older terrace deposits in uplands of river valley.	Low	Building projects should avoid areas with slopes.	Slumps, slides, and mass wasting possible.	Potential for Pleistocene fossils	Possible Native American sites.	None	Caliche, sand and gravel	Supports grasslands, cattle pastures and rangeland.	Good for most uses unless steep slopes are present.	Records the evolution of the river course over the landscape.
CRETACEOUS	Comanche Series: Edwards Limestone (Ked), Comanche Peak Limestone (Kcp), and Walnut Clay (Kwa).	Well-bedded limestone containing some chert and magnesium-rich layers; marl and marly limestone with nodules grading into well-bedded layers in upper units, some 7 m (23 ft) thick; calcareous clay grading upward into marl layers that are fossiliferous and approximately 5 m (16 ft) thick.	High in upper beds, moderate in middle beds, low to moderate in lower beds.	Heterogeneous layering may result in structural weakness making units unsuitable for heavy development.	Rockfall hazard due to ledge-forming layers exposed along slopes; clay unit susceptible to slumping and mass wasting.	Abundant fossils, including <i>Exogyra texana</i> , <i>Ostrea</i> , <i>Trochotiaria texana</i> , <i>brachydontes pedernalis</i> , <i>Trigonia</i> sp., and burrows.	Chert (flint) nodules provided tool material for Native Americans.	Possible dissolution of limestone beds.	Gypsum in Edwards Limestone; chert, building stone, crushed rock, road material.	Units form benches and steep slopes. Narrow-leaf oak trees prefer the upper surface of unit Kcp.	Good for most uses unless clay-rich layers are present; avoid heavily dissolved areas.	Abundant Cretaceous fossils.
CRETACEOUS	Shingle Hills Formation: Glen Rose Limestone Member (Kshgr); <i>Corbula</i> bed (Kshgc); Hensell Sand Member (Kshh), with conglomerate (Kshhc).	Alternating beds of limestone, dolomite, marl, and clay; some beds high in silt and sand; some arenaceous layers; <i>Corbula</i> bed very rich in fossils and widespread; sandy units as much as 21 m (69 ft) thick, becoming finer-grained upward from lower conglomerate layers; siliceous sandstone cemented with carbonate; formation appears gray to yellow-green to reddish in outcrop.	Moderate to low in upper beds.	Heterogeneous layering may result in structural weakness making the terrane unsuitable for heavy development; avoid sandstone units with soluble carbonate cements.	Rockfall hazard due to ledge forming "stair step" layers exposed along slopes.	<i>Corbula</i> , <i>Salenia texana</i> fossils	None documented	Possible dissolution of dolomite, marl, and limestone beds.	Quartz and microcline granules; road material sand in Hensell unit, dimension stone near <i>Corbula</i> bed.	Alternating beds form scarps good for burrowing animals, for bird nests if on cliffs; broad leaf oak forests on sand units.	Good for most uses unless clay-rich layers are present; avoid heavily dissolved areas.	Widespread <i>Corbula</i> bed as a paleontologic marker.
CRETACEOUS	Travis Peak Formation: Cow Creek Limestone (Kcc), Hammett Shale (Kha), and Sycamore Sand (Ksy).	Limestone member was originally a cliff-forming coquinite, with much dissolution of shells leading to increased porosity; about 13 m (43 ft) thick locally. Shale unit is calcareous, containing clay, sand, silt, and some local gray to gray-green conglomerate; 19 m (62 ft) thick locally; locally sand unit is commonly reddish, containing sand, silt, clay, and pebbles above a well-cemented basal conglomerate (cobbles more than 1 ft in diameter).	Moderate to high in well-cemented, siliceous beds.	High porosity in upper Cow Creek Limestone makes unit unsuitable for waste facilities and may prove unstable for most foundations; avoid shale units.	Dissolution may lead to structural weakness and mass wasting; rockfall potential at base of cliff-forming units.	Oysters common in lower beds of upper limestone unit; many shell casts; marine mollusks bored into upper surface of lower sand unit.	None documented	Karst dissolution of coquinite layers	None documented	Cliff-forming units with high pore space provide burrows and nesting habitat.	Rock-climbing potential on cliffs; good for most uses unless clay-rich layers are present; avoid heavily dissolved areas.	Upper coquinite unit and abundant Lower Cretaceous fossil record.
PENNSYLVANIAN	Smithwick Formation (PNsw), Marble Falls Limestone (PNmf), and spiculitic facies of Marble Falls Limestone (PNmfsp).	Upper unit contains greenish-gray shale; limestone unit is brownish-gray and crinoidal, forming a series of biohermal masses interbedded with shale, locally about 125 m (410 ft) thick; some chert present; spiculite is dark gray to light gray on weathered surfaces with some yellowish to pinkish areas on bluffs; has splintery feel and is locally 12 m (39 ft) thick.	Moderate	Shale units with springs and seeps should be avoided.	Slumps and slides possible for shale units.	Crinoids, biohermal masses, spiculites, algal micrite, corals.	Chert (flint) nodules may have provided tool material for Native Americans.	Some dissolution of limestone and crinoidal units.	Locally, chert, spiculite, and tripolite (diatomite).	Shale may be associated with springs; heavily vegetated boundary with lower units, flats associated with shale units.	Good for most uses unless clay-rich layers are present.	Spiculite and diatomaceous layers; contains Pennsylvanian fossil record for area.

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MISSISSIPPIAN	Barnett Formation (Mb) and Chappel Limestone (Mc).	Lower shale beds: dark- gray to brownish- gray weathered surfaces containing some glauconite and sand interbeds; upper limestone beds are very thin and dark gray, containing some sand and glauconite layers.	Low to moderate	Building projects should avoid areas with slopes on shale beds; avoid phosphatic shale layers.	Slumps and slides possible in shale units.	Crinoid debris, including columnals and fragments, conodonts, ostracodes, algae, foraminifers, brachiopods, trilobites, coquinites, pellets.	None documented	Possible dissolution of limestone layers; associated with sinkholes elsewhere.	Crushed stone	None documented	Avoid slopes if shale units are present	None documented
MISSISSIPPIAN -DEVONIAN	Houy Formation: bone bed (MDhb); Doublehorn Shale Member (MDhd); Ives Breccia Member (MDhi).	Bone bed contains some fossil bones, but is rich in yellowish- brown phosphorite; shale member is black, fissile, and radioactive; breccia member is 1 m (3 ft) thick containing chert and siliceous limestone fragments and nodules in rip- up beds.	Moderate	Construction and development should avoid radioactive beds.	Radioactive beds	Spores, fossils include bones of <i>Dinichthys cf. D. terrelli</i> Newberry, conodonts, <i>Sedenticellula</i> aff. <i>S. hamburgensis</i> , brachiopods.	Chert (flint) nodules may have provided tool material for Native Americans.	None	Uranium; chert phosphate minerals.	None documented	Avoid radioactive beds for all recreation.	Breccia layer records rip- up storms in ancient sea; U-Pb age dating.
DEVONIAN	Stribling Formation (Ds)	Microgranular limestone and chalcedonic to novaculitic chert interbedded with sandy limestone; lenticular to fissile bedding; weathers to gray, brown, and pinkish colors; locally 3-35 m (11 ft) thick.	Moderate to high	Suitable for most forms of development; avoid heavily jointed and fractured areas.	Rockfall hazard if unit is exposed on a slope.	Megafossils along lower surface, conodonts, brachiopods.	Chert and chalcedony may have been used as tool material.	Possible dissolution of limestone layers.	Chalcedony	None documented	Fine- grained units may weather into sharp fragments - dangerous for trails.	Type locality in Pedernales Falls quadrangle.
ORDOVICIAN	Ellenburger Group: Honeycut Formation (Oh) and <i>Ceratopea</i> bed of Honeycut Formation (Ohc).	Formation is composed of three units, all containing beds of alternating fine- to medium- grained, microgranular dolomite, and aphanitic limestone; limestone is mostly light gray to yellowish- gray, dolomite is medium to brownish- gray; some chert is part chalcedonic with some chalky appearance; approximately 207 m (679 ft) thick.	Moderate to high	Suitable for most forms of development; avoid heavily dissolved and fractured areas.	Rockfall hazard if unit is exposed on a slope.	Fossils include <i>Archaeoscyphia</i> sp., <i>Ophileta</i> sp., <i>Orospira</i> sp., <i>Jeffersonia missouriensis</i> , <i>Hormotoma</i> sp., <i>Aphetoceras</i> cf. <i>A. subcostulatum</i> ; various gastropods, nautiloids, siphuncles, cystid plates, trilobites, and brachiopods.	Chert (flint) nodules in chalk may have provided tool material for Native Americans.	Abundant carbonate for karst dissolution.	Radial quartz nodules locally; also cannonball chert, crushed stone.	Massive units may provide cliff habitat.	Avoid slopes	Type locality near Honeycut Bend.
ORDOVICIAN	<i>Archaeoscyphia</i> bed (Qha)	Unit contains abundant <i>Archaeoscyphia</i> sp. fossils.	Moderate	Unit should be avoided for development if heavy dissolution is present.	Unknown	<i>Archaeoscyphia</i> sp. fossils	None documented	Dissolution possible in fossiliferous layer.	Crushed stone	None documented	Fossiliferous units may weather into sharp fragments that would be dangerous for trails.	Widespread <i>Archaeoscyphia</i> sp. bed as a paleontologic marker.
ORDOVICIAN	Gorman Formation: aphanitic calcitic facies (Ogca), <i>Diaphelasma</i> bed (Ogd), <i>Archaeoscyphia</i> sp. bed (Oga), and dolomitic facies (Ogmg).	Lower dolomite beds are divided from upper calcitic beds by an <i>Archaeoscyphia</i> sp. zone; total of 8.8 m (29 ft) of limestone and 69 m (226 ft) of dolomite present below the zone; 32 m (105 ft) of limestone and 39 m (128 ft) of dolomite is present above the zone. Most dolomite is microgranular; a few beds are medium- grained. Dolomite is pastel gray with pink, yellow, and brown; limestone is aphanitic, light gray, and massive.	Moderate	Suitable for most forms of development; avoid heavily dissolved and fractured areas. Gorman is an aquifer- bearing unit.	Rockfall hazard if unit is exposed on a slope.	Fossils include <i>Ophileta</i> , <i>Lecanospira</i> sp., <i>Xenoplasma</i> , <i>Finkelburgia</i> cf., <i>Macluritella</i> , <i>Archaeoscyphia</i> sp., <i>Euconia</i> , <i>Diaphelasma</i> cf. <i>D. pennsylvanicum</i> , and various gastropods, cephalopods, and nautiloids.	Chert (flint) nodules may have provided tool material for Native Americans.	Abundant carbonate for karst dissolution.	Crushed stone, attractive when polished for interior stone.	Massive units may provide cliff habitat.	Suitable for most recreation; might be attractive to climbers.	Widespread <i>Archaeoscyphia</i> sp. zone as a paleontologic marker for the Lower Ordovician.

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ORDOVICIAN	Tanyard Formation, Staendebach Member: aphanitic calcitic facies (Otsca); massive, noncherty facies (Otscam); thin- bedded, cherty facies (Otscat); dolomitic facies (Otsmg); coarse- grained, noncherty, dolomitic facies (Otsgc); and fine- grained, cherty, dolomitic facies (Otsgf).	Member is mostly fine- grained, cherty dolomite with upper beds of aphanitic limestone; chert-rich beds are mostly porcelaneous and white to off- white; some oolitic layers and abundant fossils; approximately 125 m (410 ft) thick.	Moderate	Suitable for most forms of development; avoid heavily dissolved and fractured areas.	Ledge rocks may fall if unit is exposed on a slope.	Abundant fossils, including nautiloids, <i>Ozarkina</i> cf. <i>O. complanta</i> , <i>Helicotoma</i> , bryozoans, <i>Sinuopea</i> , <i>Ophileta</i> , <i>Ectenoceras</i> , <i>ribearia</i> cf. <i>R. calcifera</i> , <i>Lytopsira</i> , oolite beds.	Chert (flint) beds may have provided tool material for Native Americans.	Abundant carbonate for karst dissolution.	Oolitic limestone, crushed rock.	None documented	Avoid slopes; flinty surfaces may be sharp.	Abundant Lower Ordovician fossil record.
ORDOVICIAN	Tanyard Formation, Threadgill Member: aphanitic, calcitic facies (Ottca); thin- bedded facies(Ottcat); massive facies (Ottcam); dolomitic facies (Ottmg); fine- grained, dolomitic facies (Ottmgf); coarse- grained, dolomitic facies (Ottmgc); dolomitic and calcitic facies (Ottmgca); and fine- grained, dolomitic and calcitic facies (Ottmgfca).	Dolomite beds are coarse grained, light gray, and noncherty except where a light- to brownish-gray quartzose chert occurs locally; some light-gray, fine- grained limestone is present; intergradation between limestone and dolomite in some places. Unit is approximately 74 m (243 m) thick locally.	Moderate to high in quartz beds.	Suitable for most forms of development; avoid heavily dissolved and fractured areas.	Ledge rocks may fall if unit is exposed on a slope.	Scant fossils, including <i>Sinuopea</i> sp., <i>Ozarkina</i> sp., <i>Schizopea</i> , trilobites, <i>Euconia</i> , <i>Ectenoceras</i> .	None documented	Carbonate rocks present	Crushed stone, dimension stone; ledge rock attractive when polished for interior stone.	If ledges form between various layers, nesting habitat is possible.	Good for most uses unless steep slopes are present.	None documented
CAMBRIAN	Moore Hollow Group, Wilberns Formation, San Saba Member: dolomitic facies (Cwsmg); fine-grained, dolomitic facies (Cwsmgf); aphanitic, calcitic facies (Cwsca); and coarse- grained, dolomitic facies (Cwsmgc).	Dolomitic facies and limestone predominates in these units, which are mostly cherty and fine-grained with some non- cherty layers; lower beds are fine- grained, yellowish- gray, medium-bedded dolomite with some oolitic zones. Unit is approximately 122–158 m (400–518 ft) thick.	Moderate	Suitable for most forms of development; avoid heavily dissolved and fractured areas.	Rockfall hazard if unit is exposed on a slope.	<i>Finkelnburgia</i> sp., <i>Scaevoxyra</i> cf. <i>S. elevata</i> , trilobites, <i>Calvinella</i> , <i>Scaevoxyra</i> cf. <i>S. svezeyi</i> , oolites, stromatolites.	None documented	Possible carbonate dissolution in dolomite and limestone units.	Oolitic limestone; stromatolites; crushed rock, including surfacing granules.	Vegetation aligned with bedding.	Good for most uses unless steep slopes are present.	Abundant Cambrian fossils.
CAMBRIAN	Moore Hollow Group, Wilberns Formation: Point Peak Member (Cwpp), Morgan Creek Limestone Member (Cwm), and Welge Sandstone Member (Cww).	Lower sandstone unit is brown, nonglaconitic, recrystallized quartz grains; limestone unit is reddish to pinkish and contains thick, sand- rich beds; upper beds are thinner with less sand and light gray to green with glauconite; stromatolitic limestone is present in lowermost unit with some siltstone and stylolites.	Moderate to high in quartz-rich beds.	High porosity in lower beds may make them unsuitable for waste facilities.	Ledge rocks may fall if unit is exposed on a slope.	<i>Eoorthis</i> , conaspid zone fauna, <i>Billingsella</i> , and stromatolites present locally.	None documented.	Possible carbonate dissolution in limestone unit.	Stromatolites and stylolites, limestone, dark ledge rock.	Vegetation aligned with bedding.	Avoid areas high in glauconite; good for most uses.	Contains some of the first trilobites collected; algae (early life on Earth).
CAMBRIAN	Riley Formation: Lion Mountain Sandstone Member (Crl), Cap Mountain Limestone Member (Crc), and Hickory Sandstone Member (Crh).	Sandstone member, poorly exposed locally, contains hematite nodules and some cross-bedded coquinite; unit is ~9–14 m (30–46 ft) thick; limestone member contains coarse detrital quartz grains and microcline with sparse granitic pebbles, approximately 151 m (497 ft) thick; lowermost sandstone member is noncalcareous and nonglaconitic, massive and contains crossbeds; poorly sorted conglomerate at base; locally 84 m (276 ft) thick.	Moderate	Heterogeneous layering may result in structural weakness making the formation unsuitable for heavy development; avoid heavily jointed limestone.	Rockfall hazard due to ledge- forming layers exposed along slopes.	Trilobites, brachiopods	None documented	Possible carbonate dissolution in coquinite and limestone units.	Hematite nodules, coquinite, phosphate minerals, sphalerite, galena	Limestone supports cedar, live oak, yucca and cacti; sandstone supports deciduous forest (broad leaf oak).	Good for most uses unless clay rich or on a slope.	Contains a large collection of Cambrian trilobites; some phosphatic layers.
PRECAMBRIAN	Valley Spring Gneiss (PCvs), Oatman Creek Granite (PCoc), and Town Mountain Granite (PCtm).	Gneiss is massive, fine- grained, light- colored (predominantly pink), and highly feldspathic; middle granitic unit is pink to red, medium- to coarse- grained (average grain size, 7 mm, or 0.28 in.), containing microcline, microperthite, quartz, plagioclase, and biotite; some cataclastic texture (brittle deformation) common; second granitic unit is pink, coarse- grained, somewhat porphyritic, and composed of microcline, quartz, plagioclase, and biotite.	High	Suitable for most forms of development; avoid heavily deformed and fractured areas.	Rockfall hazard if unit is exposed on a slope.	None	None documented	None	Lead and zinc minerals, magnetite, amethyst, azurite, galena, garnet, serpentine, fluorite, apatite, titanite, zircon; traces of gold.	Locally forms high- ground habitat.	Good for most uses unless steep slopes are present.	Records Grenville orogeny; contains unique ilanite granite.